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527 F.2d 1226, 188 U.S.P.Q. 365


United States Court of Customs and Patent Appeals.  
 Application of William P. CLINTON et al.  
 Patent Appeal No. 75-587.

Jan. 15, 1976.


Appeal was taken from decision of Patent and Trademark Office Board of Appeals affirming examiner's rejection of certain claims in application, serial No. 830,195, for an 'Improved Process for Producing Aromatized Freeze-Dried Coffee.' The Court of Customs and Patent Appeals, Lane, J., held that obviousness does not require absolute predictability although a reasonable expectation of success is necessary and that claims 1, 3, and 5 through 9 were properly rejected as obvious in view of prior art.

Affirmed.


## West Headnotes

[1] Patents 291  16(1)  
291k16(1) Most Cited Cases  
 (Formerly 291k18)

The "obviousness" sufficient to render a claimed invention unpatentable does not mean absolute predictability, however, a reasonable expectation of success is necessary. 35 U.S.C.A. § 103.

[2] Patents 291  113(6)  
291k113(6) Most Cited Cases

Absent evidence to the contrary, reviewing court accepted statements in patent applicant's specification as proof that the matter therein stated to be critical was, in fact, critical.

[3] Patents 291  16.30  
291k16.30 Most Cited Cases  
 (Formerly 291k18)

Claims 1, 3, and 5 through 9 of application for patent for an "Improved Process for Producing Aromatized Freeze-Dried Coffee" were properly rejected as obvious in view of prior art. 35 U.S.C.A. § 103.

Patents 291  328(2)  
291k328(2) Most Cited Cases

2,509,681 , 2,751,687 , 3,283,522 , 3,362,178 ,

3,428,784. Cited as prior art.

\*1226 Michael J. Quillinan, White Plains, N.Y., attorney of record, for appellants; Cameron, Kerkam, Sutton, Stowell & Stowell, Edward J. Kondracki, Washington, D.C., of counsel.

Joseph F. Nakamura, Washington, D.C., for the Commissioner of Patents; Gerald H. Bjorge, Washington, D.C., of counsel.

Before MARKEY, Chief Judge, and RICH, BALDWIN, LANE and MILLER, Judges.

LANE, Judge.

This is an appeal from the decision of the Patent and Trademark Office Board of Appeals affirming the examiner's rejection of claims 1, 3, and 5 through 9, all of the claims remaining in application serial No. 830,195, filed May 20, 1969, for an 'Improved Process for Producing Aromatized Freeze-Dried Coffee.' We affirm.

## Background

The subject matter of the claims is a process of producing a stable, freeze-dried, soluble coffee. Roasted and \*1227 ground coffee is percolated to obtain a coffee extract containing from 20% to 35% soluble coffee solids. This initial coffee extract is freeze concentrated by partial freezing to form ice crystals and concentrated coffee extract. The concentrated coffee extract, containing 35% to 55% soluble coffee solids, is separated from the ice crystals and frozen, comminuted, and dried.

The concentrated coffee extract is first cooled below its eutectic point, and the frozen extract is ground to a granular particle size.

Freeze drying the granular frozen concentrated coffee extract is generally accomplished at a condenser temperature below -30°F. and a pressure below 500 microns, until the granular frozen extract has a moisture content of between 1% and 2.5%.

Claims 1 and 8 are representative:

1. A process for preparing a granular freeze-dried coffee having a dark color which comprises percolating roasted and ground coffee to obtain a

coffee extract containing 20-35% soluble solids and desired flavor and aroma values, freeze-concentrating said extract to a solids level of 35-55% by partially freezing the water in said extract as ice crystals and removing said ice crystals from the concentrated extract, cooling said concentrated extract to below its eutectic point, grinding the frozen extract to a granular particle size, and then freeze-drying said granular frozen extract to between 1 and 2.5% moisture under vacuum conditions of less than 500 microns while

maintaining the product temperature of said coffee below 120° F.

8. The process of claim 1 wherein the coffee extract is chilled to between 33° and 45° F. and held for a period sufficient to cause insoluble sediment to form in the extract and then separating said sediment from the extract prior to freeze-concentration.

The patents relied upon by the board are:

Flosdorf

Colton

Ganiaris

Cottle et al.

Clinton et al.

The board also relied on M. Sivetz, *Coffee Processing Technology*, 14-25 (1963).

Flosdorf discloses a process of freeze drying fruit juices and extracts such as coffee extract. The solution to be freeze dried is preconcentrated, e.g., by subjecting the material to partial freezing with the formation of a slurry of ice crystals and concentrate, and separating the concentrate from the ice crystals. The preconcentrated product is then frozen and, after freezing, subjected to a high vacuum to remove the water present and dry the product. The dried product may be granulated. If the process is carried out as a continuous process (rather than a batch process), the concentrate may be frozen and granulated prior to freeze drying.

Colton discloses a process of preserving materials such as food extracts and beverages by freezing the material, granulating the frozen material, and freeze drying the frozen granules.

Ganiaris discloses a process for freeze concentrating an aqueous solution such as coffee. The aqueous solution is chilled to form a slurry of ice crystals and concentrated aqueous solution. The concentrated solution is separated from the ice crystals.

Cottle et al. disclose a process of removing sediment formed on cooling an aqueous solution. Upon cooling, an aqueous solution may form a sediment at a temperature slightly above the temperature at which ice crystals begin to form. This is disclosed to be a problem in processes of concentration by crystallization, e.g., concentrating food products and beverages by crystallization. This sediment may be removed and the solution further cooled to form a slurry of ice crystals and concentrated aqueous solution. The ice crystals are separated from the concentrated aqueous solution.

Clinton et al. disclose a process of freeze drying a coffee extract. The coffee extract is slowly frozen from its ice

point to below its eutectic point over a period of at least 15 minutes to develop a non-ordered distribution of dendritic ice crystals. The dendritic ice crystals are characterized by non-parallel main stems, smaller extending branches from said main stems, and an absence of ice crystals of non-dendritic form in the eutectic mixture located between the dendritic ice crystals. The frozen coffee extract is comminuted to obtain a granular product. This frozen granular product is vacuum freeze-dried.

The portion of the Sivetz treatise on coffee processing technology relied upon discloses that freeze concentration can produce a concentrated extract containing 50% soluble coffee solids. Although Sivetz states that (at the time of his publication) freeze concentration of coffee solids was not practiced commercially, this statement is qualified by the statement that both theoretical and practical considerations favor freeze concentration.

The examiner rejected all of the claims under 35 U.S.C. 103, either in view of the disclosure of Flosdorf considered together with Colton and Sivetz, or in view of the disclosure of Clinton et al. considered together with Ganiaris. The examiner also relied upon the disclosure of Cottle et al. in connection with the cooling and clarification steps of claims 8 and 9. The board affirmed each rejection.

#### OPINION

[1] [2] [3] Appellants admit that the individual steps of freeze concentrating and freeze drying a coffee extract are disclosed in the prior art, but contend that there is no suggestion in the prior art to combine these individual steps. With respect to the additional steps of cooling and clarification in claims 8 and 9, appellants admit that these steps are also generally disclosed in the prior art, but contend that it would not have been obvious to apply these procedures to remove sediment from coffee extract prior to freeze concentration. Appellants also contend that

when all the prior art is considered together, one of ordinary skill in the art would not have a sufficient basis for the necessary predictability of success to sustain a rejection under 35 U.S.C. 103. In re Mercier, 515 F.2d 1161, 1167 (CCPA 1975).

We have carefully reviewed the record and are persuaded that a person of ordinary skill in the art would have had sufficient motivation to combine the individual steps forming the claimed process. In re Adams, 356 F.2d 998, 1001-02, 53 CCPA 996, 1000 (1966) ; In re Bergel, 292 F.2d 955, 956-57, 48 CCPA 1102, 1105 (1961).

We first consider the references by themselves to see whether they suggest doing what appellants have done. In re Skoll, 523 F.2d 1392 (CCPA 1975). Flosdorf alone suggests subjecting a coffee extract to a combination of freeze concentration and freeze drying. Cottle et al. disclose that freeze concentration of food products and beverages generally may result in the formation of a sediment which can be removed by cooling and clarification. Although Cottle et al. do not disclose sediment formation in coffee extract in particular, we think it would have been within the ability of a worker of ordinary skill in the art aware of Cottle et al. to subject a coffee extract to gradual cooling and to remove any resultant sediment prior to freeze concentration.

We next consider whether a person of ordinary skill in the art combining the individual steps which form the claimed process would have a sufficient basis for the required expectation of success. Obviousness does not require absolute predictability, but a reasonable expectation of success is necessary. In re Mercier, supra; In re Naylor, 359 F.2d 765, 54 CCPA 902 (1966) ; In re Pantzer, 341 F.2d 121, 52 CCPA 1135 (1965). Flosdorf states that the freeze-dried coffee \*1229 obtained by the disclosed process has excellent properties. Appellant argues that Sivetz discloses that some flavor is lost in freeze concentrating a coffee extract. Nothing in the Sivetz reference detracts from the clear statements in Flosdorf. Cottle et al. are concerned with preserving the original freshness and flavor of food products and beverages. We think a person of ordinary skill in the art would reasonably expect that the combination of steps suggested by the references would produce a freeze-dried coffee having desirable properties. We conclude that these references made a prima facie case of obviousness which appellants have failed to rebut.

Appellants also contend that the Board of Appeals has ignored certain claim limitations requiring freeze drying the coffee extract to a final moisture content between 1% and 2.5%. Appellants point to certain statements in the disclosure of their application which they allege establish

that the claimed moisture content is critical. Appellants' specification states:

It is necessary to dry the coffee extract to a stable moisture level of between 1 and 2.5%. Above this moisture range, it has been found that the soluble coffee product cakes and develops off-flavors upon storage. However, care should be taken not to dry the extract to a level of below 1% moisture since over-drying will cause an excess removal of aromatic materials including those which are essential to a good coffee flavor.

Absent any evidence to the contrary, we accept these statements as proof that the claimed final moisture content is critical. Pines v. McAllister, 188 F.2d 388, 392, 38 CCPA 981, 988 (1951). Nevertheless we believe that a person of ordinary skill in the art would find the claimed final moisture content obvious in view of the cited references. The only detailed disclosure in Flosdorf describes freeze concentrating and freeze drying orange juice to a final moisture content of about 0.3%. In our opinion, one skilled in this art would start with 0.3% as a possible final moisture content for freeze-dried coffee. Recognizing the flavor deficiencies, the skilled artisan would tend to depart from 0.3%. The references all state that freeze drying is an expensive method of removing water. Economics alone would motivate a person of ordinary skill in the art producing a freeze-dried coffee by the Flosdorf process to find the highest final moisture content consistent with the excellent properties Flosdorf describes. A person of ordinary skill in the art, having no reason to expect that the optimum final moisture content of freeze-dried coffee is the same as freeze-dried orange juice, and being motivated to permit a higher final moisture content if possible, would soon find the claimed final moisture content.

#### *Conclusion*

The decision of the board is affirmed.

Affirmed.

Cust. & Pat.App. 1976.  
Application of Clinton  
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